Preface

This volume focuses on methods and some recent estimates for predicting macroeconomic results for national economies around the world. The economies of the world, as they might be listed in major multinational economic reports from institutions, such as the International Monetary Fund, the World Bank or the United Nations, are very numerous – more than 200 – but these sources do not provide explicit national accounting details and recent performance results for all of them. They do, however, pay attention to major interesting performance results for between 150 and 200.

Naturally, the largest economies of the world are given separate treatment. These include the USA, Japan, Germany and China, the four largest in that order, although China is moving forward in ‘leapfrog’ style.

Another feature of the various chapters in this book is that the methods being used are generally applicable to countries in North America, Asia, Europe and Latin America. In Asia, where superior macroeconomic performance is now taking place, the apparent competition for economic stardom is between China and India. India has been one of the most-studied countries in the world, ever since achieving independence from the UK, but its hugely successful economic expansion did not get under way until a few years ago, when it appeared that India was becoming a major factor in outsourcing of valuable economic services, using information technology (IT) software in building up export activity. This recent burst of activity may not seem, by itself, to put India in a position for special consideration as regards its economic potential. India, however, was adversely burdened with meteorological uncertainty with respect to a kind of cyclical or random fluctuation of rainfall – monsoon activity, if you like. Until the emergence of offshoring activity and provision of other international services, India suffered the uncertainty of climate change for its large agricultural sector, and poor times in primary activity offset much of the growth of manufacturing, and even imputed cyclical movement to those sectors that are dependent on agriculture. For example, cotton or other raw material for inputs into textile manufacturing contributed to a spread of perverse monsoon conditions, from time to time. Now, outsourcing of IT software provides a buffer to keep the economy on a more predictable and profitable path.
India’s new economy of the past ten or more years has been able to grow more consistently, and realize the gains from new technologies, steady growth of more primary sectors, improved living conditions, expanded tourism, and durable consumer goods, such as cars. India’s reformed economy constitutes a second Asian growth center that is close on the heels of China’s growth trajectory. Our model projections indicate an Indian growth path of 7–9 percent annually by Dr Sudip Basu (Chapter 3), close on the heels of China’s 9–11% annually by Wendy Mak (Chapter 2).

It is remarkable that these two Asian giants are the most populous countries of the world, each at 1 billion persons or more. This book aims to provide a short-run basis for tracking this peaceful economic contest between two different systems.

Our forecasting experience with China has been developed on a fuller and more substantial base, while India has been closely examined on a comparative basis for less than one year, but steps are being taken to bring the Indian material, for comparative purposes, up to date as quickly as possible.

China emphasizes economic policy guidance and control under close political supervision, and ongoing measures for economic enhancement are stated to be implemented ‘in the Chinese way’. By contrast, Indian economists and general policy executives claim that they are moving in expansionary directions by ‘democratic principles’. It is evident that India is exploiting an important advantage that China does not have, namely, a higher educational system along British lines, based on fluency in the English language, now the main language for IT. These two giant economies are clearly different, but together they are dominant in the present Asian surge, and the authors plan to observe this contest going forward by tracking the two economies frequently, every fortnight for China and every month for India.

Another feature of this volume is to show how economic systems in transition can be studied through repeated forecasts by the methods featured in this book.

The two major economies in transition from plan to market are China and Russia. The Chinese case is presently in competition with the Indian case, as discussed above, but in 2002 several Western-oriented economists challenged China’s estimates of its GDP (gross domestic product) records of strong growth rates, claiming that they were exaggerated and not believable. In order to clear the atmosphere of that period of accusation, Süleyman Özmucur and I turned to the use of the method of principal components, based on direct measurement of many straightforward estimates in quantitative physical terms or accepted indexes in much the same manner as generations of ‘Kremlinologists’ examined Soviet and
Chinese data on well-understood and observed statistics of tonnages, kWh, gallons, bushels, etc. to approximate, for intelligence officials, how the centrally planned economies were growing.

The students of planned economies, however, had no satisfactory guidelines on bundling these diverse physical measures of different kinds of production. Professor Özmucur and I estimated principal components of diverse time series of quantitative magnitudes and studied the multiple correlation estimates between published GDP values for China and some principal components. We found very high correlation relationships between the official GDP estimates and principal components of major quantitative magnitudes of observable economic flows.

When it became urgent to turn to modern Russian growth for a presentation in recognition of St Petersburg’s Tercentenary in 2002, I, with the guidance of Dr Vladimir Eskin and Dr Andrei Rudoi, drew upon the method of principal components for estimation of Russia’s GDP expansion path, and came to the conclusion that principal components of several quantitative measures of physical economic time series correlated well with the dynamics of Russia’s GDP estimates. Not only did we find good agreement, much like the Chinese results, but also we found that the Russian economy exhibited dynamics much like many other large countries that were not in transition. The method of principal components turns out to be very good for estimating and forecasting macroeconomic dynamics. There are few long, historical data series on production, employment, infrastructure and price dynamics for transition countries, especially for the extremely important cases of China and Russia. China, at the present time, is building highly usable national statistics that will soon permit econometric studies on a par with those that can be made in Europe, North America, Japan, South Korea, Australia and New Zealand, but at this juncture, it is wise to turn to intensive use of principal components, as demonstrated in this volume, for economies that do not have long-standing data files in the time dimension, but do have such data files for relatively short histories across areas or sectors of important economic activity. Wendy Mak (Chapter 2) is able to make an intensive analysis of the Chinese economy, including meaningful fortnightly forecasts from detailed analysis of principal components. Correspondingly, Dr Vladimir Eskin and Mikhail Gusev (Chapter 4) produced similar results for Russia, although the Russian official agencies for data analysis of the modern economy needed to be much more fully developed in order to access the potential information flows that fully describe the workings of the economy.

Significant attention has been paid among economists and investors to the grouping of countries by The Goldman Sachs Group according to an
acronym, BRIC, which stands for Brazil, Russia, India and China. The last three countries have received individual chapter treatment, and it was recognized that special treatment should be accorded to Brazil.

Andrei Roudoi, who prepared the chapter on Germany (Chapter 5), one of the major advanced countries in our presentation of forecasting systems, had special knowledge about Brazil, when studied from the viewpoint of our procedures using principal component estimation for generating high-frequency forecasts.

Accordingly, Dr Roudoi prepared a special treatment for Brazil in a forecasting mode, and it has been set apart in an Appendix. He followed the same statistical steps that have been used in this volume on forecasting techniques for other countries, and prepared such a system for Brazil, which can be used for making the same kinds of forecasts that are presented for other countries.

Mexico is an unusual case of a developing Latin American economy, in that it has a very strong and lengthy database going back to a period before the Second World War; so it can be studied, to good advantage, by our preferred methods of econometric analysis. Dr Alfredo Coutiño does this in his chapter (Chapter 6), with appropriate attention paid to the close linkage between the Mexican and US economies. Mexico does not quite match Brazil’s economic status, but is well advanced among developing countries. Dr Alfredo Coutiño has crafted an excellent high-frequency model system for Mexico.

Japan and the Republic of Korea are major economies in the Asia-Pacific area. Both are modern manufacturing economies, but of course Japan is much larger. They have close economic ties with one another and trade significantly with China. Economic ties with the whole world, and the USA in particular, since the end of the Second World War are important.

Japan, South Korea and China are partners with Russia, Mongolia and North Korea in organized cooperation for the economic development of Northeast Asia at the Economic Research Institute for Northeast Asia (ERINA). Japan and South Korea have trading relationships in goods and services with the whole world, including the USA, on a large scale. The aims and objectives of this volume are enhanced by Professor Yoshihisa Inada of Konan University in Japan (Chapter 7). He makes economic forecasts every two weeks for the Japanese economy based on the high-frequency techniques that are prominent in this volume, and Kevin Chung disseminates monthly forecasts of the Republic of Korea in the same way (Chapter 8).

In addition to rounding out the BRIC composite forecasts, Dr Andrei Roudoi has also chosen the largest economy in Western Europe, namely
Germany, for presentation of high-frequency forecasts (Chapter 5). The postwar economic history of Germany needs analysis along the lines of this volume because its postwar history contains strained relationships between West and East Germany, which constituted two very different economic systems until unification after the tearing down of the Berlin Wall. The shorter sample, after unification, is well handled with the principal components approach across sectors of the economy as well as across time periods.

A major national group living in Germany is the Turkish immigrant population. Accordingly, Süleyman Özmucur has made a separate analysis for Turkey (Chapter 9). His chapter is very informative for its economic content, but he has also undertaken to explain the definitive and mathematically sound statement about the meaning, interpretation, and use of principal components analysis.

Most of the chapters in this book relate to country performance, requiring appreciation of the general economic background for each country, as a case study, followed by specific statistical techniques for making high-frequency forecasts up to two quarters (or six months) ahead. There are, however, some different but related interests.

In the case of the US current quarter model (CQM) there was an important methodological point; individual components of the GDP (or its specific sub-groupings) and individual monthly prices that can be found in advance of the target values could be used as surrogate approximations for specific GDP or price components.

Süleyman Özmucur and I conceived a representation of the US Treasury’s yield curve (the curve of interest rates on specific maturities, ordered by the length of the maturity). We also had another objective in mind, namely to enquire whether it would be possible to make even higher-frequency estimations of the yield-curve concept, that is much closer to real-time computational sequencing. Our deep interest in high-frequency economic forecasting has been based for several years on quarterly and monthly economic statistics. The chapter on the treasury yield curve (Chapter 10) attempts to provide insight into this important curve at weekly, daily, or intra-daily intervals. In a sense, we explore the issue: how close to real-time economic forecasting can we get? For this approach we must use statistical data that are available at ‘any time’ during the market working day.

We describe a trading day as one that functions on a supply–demand market-clearing basis continuously from 9.00 am until 4.00 pm. At the beginning, end or any working time during the regular market day’s trading in US government bills, notes or bonds we can forecast treasury yields. The bulk of our empirical work on the yield curve views time in this way for US government securities transactions. What do we know at 9.00
am on a regular trading day? We know how markets have functioned in the Pacific Far East, in mainland Asia, in Europe and in futures markets in the USA, Canada and Latin America. In econometric language, these readings of market performance, up to the opening of US market trading, are ‘predetermined variables’.

We classify treasury securities by their maturity date spread over 11 different maturities, from one month to 30 years. From our point of view, we are not simply looking for a bivariate relationship between yield and maturity; we estimate, instead, separate multivariate equations among yield, maturity date, central bank quotations, realized inflation (marketing opening time), public debt, tax legislation and whatever is found to influence the observed yield during the trading day. In the USA we estimate a separate equation for the yield on each major maturity. At any time during the day, up to market closing time, we can use our estimated yield equations, for each maturity, to provide a yield estimate from each equation, in order. A graphic display of computed estimates of yield, ordered by maturity, traces out a curve, which is our conception of a yield curve. In our chapter, we show forecast accuracy tables for our calculations of yield (e.g. on the ten-year treasury) against simple rules for more mechanistic estimates. According to our concept of the yield curve and the several equations ordered by maturity, our approach leads to more accurate yield forecasts and more meaningful descriptions of what is meant by the ‘yield curve’.

Countries that want macroeconometric forecasts and approach some of the economists involved in the development of this book usually ask, after being shown high-frequency models, ‘What is your method and estimate for a longer-term horizon?’ They want, in addition to short-term forecasts of two or even three quarters ahead (or six to nine months ahead), forecasts for one, two or three future years.

As long ago as the highly productive days of Jan Tinbergen at the League of Nations in Geneva, there was intense interest in using the available databases of the interwar period of the 1920s and 1930s in constructing models of a national economy, with an aim to make economic forecasts or plausible scenarios annually. In the 1930s, Tinbergen wanted to unlock the secrets of the business cycle. There were no databases or computer facilities like those of today, in either richness or depth. Professor Kushnirsky (Chapter 11) has interpreted results from an unusual database, one that permits both low- and high-frequency information to lead to very short-run forecasts, up to one year at most, and also more information to enhance the model through its application to forecasts of up to three or more years in advance. Professor Kushnirsky puts together a short-run database for estimating a model and its extrapolation of two
to four quarters in the future and then considers the use of this informative step for the use of a lower-frequency model, say an annual model, or even a structural quarterly model that can be solved for one, two or three years into the future. The high-frequency model thus provides initial input information for the low-frequency system.

The high-frequency information can be used as input into the low-frequency system, and some corresponding equations can be suppressed for the latter. Kushnirsky also considers whether the high-frequency information implies higher or lower activity levels in the low-frequency system and devises rules for allowing the high-frequency system to change the solution trajectory of the low-frequency system. This obviously requires the use of two models in tandem, for medium-term forecasting, over horizons that are long enough to satisfy model users, and indicates how this could have been used in judging the macroeconomic forecasts of the Fox Administration in Mexico.

In addition to special chapters on short-term yield-curve forecasting and longer-term forecasting, Giselle Guzmán (Chapter 12) investigates forecasting broad market averages (S&P500, Russell 1000, Russell 2000) for some different investor groups, with special reference to the use of sample survey information, which is available prior to trading periods.

She deals significantly with several sample surveys that are well known, and regularly the subject of media reporting, but they are not completely unrelated to one another; therefore she turns to the method used frequently in this volume, namely, principal components analysis in order to deal with the mutual correlations of the various surveys. Much new ground for security market analysis is covered by this chapter.